

Tropical GRIP Forecast Discussion for September 10, 2010

Created 1600 UTC September 10, 2010

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Summary:

The DC-8 is no-fly today and hard down tomorrow in anticipation of potential flights into PGI-44L beginning Sunday evening. The Global Hawk also has a no-fly day, but a science flight into PGI-44L is possible on Sunday. Finally the WB-57 has been repaired, however no targets are within range, so it will not be flying for the next several days. The main focus continues to be on PGI-44L, and flights by the DC-8 and Global Hawk are planned for Sunday and Monday. PGI-44L looks slightly more organized on satellite today, though the GFS is no longer substantially developing it. However, the ECMWF and UKMET continue to develop the system as it moves NW through the eastern Caribbean. Igor also looks better today and has redeveloped into a tropical cyclone, with all indications suggesting that it will strengthen into a strong hurricane within the next week. However, the news is not good for all systems. Ex-Gaston remains little more than a weak trough with scattered convection while PGI-39L doesn't have any convection at all.

Forecast for 1600 UTC 9/07/2010:

Synoptic Overview:

The 0600UTC surface analysis indicates a number of features of interest (**S1**). PGI-38L/ex-Gaston is now merely a surface trough associated with a small amount of disorganized convection (**S2**). There is no indication of a surface circulation on visible satellite imagery (**S3**), and the prospects of development are grim at best. PGI-44L/AL92 has moved very little over the past 24 hours and remains centered over the Windward Islands. A circulation is evident in visible imagery, and the convection is showing some signs of organization. Further west, visible imagery indicates a low level broad circulation associated with PGI-39L at 15N/45W, however it is devoid of deep convection, and remains a non-player in the tropics. Tropical Depression Igor has moved westward to 16N/29.3W, and appears better organized on satellite today. Finally, PGI-43L was not analyzed by the OPC at 0600UTC, but it is located at 11N/8W and is associated with some deep convection, though the convection has dissipated somewhat over the 12 hours preceding 1200UTC (**S5 and S6**). Finally, a large mid latitude trough is emerging from the eastern US coast which should act to break down the mid latitude ridge, impacting the progression of Igor within the next few days.

At upper levels, an upper level low which has been propagating westward is now located over the Bay of Campeche (**S8**). The mid latitude cyclone emerging from the east is also very evident at 200mb. There is also a weak elongated upper level trough through the central Atlantic which has persisted for the better part of a week. Upper level winds

(S9) are very strong along the upper level trough, however there are generally weak easterly winds through the tropics. Good anticyclonic outflow is apparent over Igor, and some outflow and corresponding upper level divergence has been observed over AL92. The wind shear is low to moderate through most of the tropics except for locations influenced by the outflow from AL92, Igor, and the ITCZ (S9).

Looking at lower levels, there is a strong 850 vorticity max with Igor (S10). However, AL92 is much weaker and fairly asymmetric. The PGI-39L signature indicates that it has indeed split as was indicated yesterday, and it too is fairly weak.

Finally, SSTs remain high through most of the tropical Atlantic (S11), and Ocean Heat Content is very high in the Caribbean (S12).

Features of Interest:

Ex-Gaston/PGI-38L:

At 1200 UTC today, the CIMSS PREDICT TPW analysis with pouch positions places the remnants of Gaston at 16.4° N and 77.6° W (S6). Not much has changed since yesterday with this system. The visible satellite imagery shows a few pop up areas of highly disorganized convection in the vicinity of ex-Gaston (S3). The loop of the visible satellite imagery shows no evidence of a closed circulation as the remains of Gaston continue to gradually move in a west-southwestward direction towards Central America. There is slightly more 850hPa vorticity associated with the remnants of Gaston (S10) and ex-Gaston is in a highly favorable environment for development with low 200-850-hPa wind shear (S9), high SSTs (S11), and a very moist environment as indicated by water vapor imagery (S4). However, due to the lack of a surface circulation and the fact that none of the models do anything in terms of redevelopment, no genesis is anticipated before the remnants move across Central America within the next 3 days (G1).

PGI-44L/AL92:

PGI-44L is currently holding its own. Surface observations from the island of Tobago have consistently reported westerly winds, while observations from Barbados have indicated southeasterly winds, suggesting the presence of a broad circulation. This is also evident in visible imagery (44A) and CIMSS 850 mb vorticity analysis (S10). Convection, after being on the wane for much of last night, has begun to make a comeback this morning (S2). PGI-44L is currently located in a very moist pouch of high total precipitable water (S6), with some dry air present to the north and northeast. The vertical wind shear is currently around 14 kts from the ENE, as analyzed by the 12z SHIPS.

The environmental conditions during the next few days appear to be favorable for development. The oceanic heat content values in the Caribbean are some of the highest in the entire Atlantic basin (S12). The 12z SHIPS, based on the GFS fields, indicates that the moderate easterly shear currently impacting the system will weaken by 36 hours, and

will be under 10 kts thereafter. The ECMWF also shows weak to moderate shear over the next 5 days (**44B**). This is due to the fact that PGI-44L will be on the south side of an upper-tropospheric anticyclone (**44C**). The dry air to the north and northeast of the system doesn't appear to be a problem, since the circulation is located fairly far to the south and is well-protected. Despite these seemingly favorable conditions, the GFS in the past couple runs keeps PGI-44L as a weak disturbance, while the ECMWF and UKMET show substantial development. The ECMWF ensembles are more aggressive with development now than they have ever been (**44D**). There are vast differences in the depiction of the total precipitable water fields in the ECMWF vs. GFS (**44E**, **44F**) which may be contributing to the discrepancy. Intensity model guidance shows great uncertainty (**44G**), with the statistical models showing significant intensification, while the dynamical models (based off the GFS fields) showing little or no development. This makes the intensity forecast difficult, but it is reasonable to expect this to develop into a TD a couple days down the road, with gradual to perhaps substantial intensification thereafter. The PREDICT dropsondes will be ingested into the ECMWF today, which will hopefully shed some light on this.

The 1200 UTC model guidance generally tracks PGI44L toward the west-northwest over the next five days (**44H**). If the system takes the left-most track, it would remain far enough south to avoid direct interaction with the Dominican Republic or Cuba. If, however, the system tracks closer to the right side of the model guidance, the system would directly traverse parts of these land masses over the Caribbean. The ECMWF and its ensembles still take the system west-northwest over the Caribbean Sea and then very close to Jamaica over the next 96 hours (**44B**, **44D**).

PGI-39L

PGI-39L is very weak and associated with no convection. It consists of a very broad low level circulation which is merely analyzed as a trough by the OPC. It is forecast by all models to persist for a day or two before dissipating entirely. This system is not of interest to GRIP, and barring a sudden change in structure, it will no longer be tracked due to its dissipation.

PGI-42/ Igor:

Igor was downgraded by the NHC to a tropical depression as of 2100 UTC yesterday before regaining tropical storm strength at 1500 UTC today. Igor is presently located at 16.4°N, 31.0°W with 35 kt winds and moving westward at 14 kt. Low-level vorticity analysis (**I1**) depicts a strong maxima associated with the system in addition to clear rotation seen in the visible satellite loop. A SSMIS overpass at 1014 UTC depicted one large convective cell to the west of the vorticity maxima (**I2**). Igor remains embedded in a deep moisture plume with a hint of dry air wrapping around the western edge of the marsupial pouch (**S6**). Initialization of the GEOS-5 shows dust at lower levels wrapping around the pouch but not entering into it (**D1**). The system at present is under about 10 kt of shear and is projected to track westward between two belts of higher shear to the north and south (**I3**). Low-level convergence and upper divergence also are favorable for intensification (**I4**).

The GFS and ECMWF (**I5**) keep the system moving on a track due west with vorticity and OW values very well established. Both models keep shear values high with the GFS showing a large increase at 60 hours. Track consensus shows the models tightly clustered on a west-northwest solution with few outliers (**I6**). Intensity forecasts are much more varied with many of the models having Igor as a strong Category 2 storm by 72 hours while the GFNI brings it to a category 5 storm in 120 hours (**I7**).

Officially the NHC projections for Igor are as follows:

Initial	10/0900Z	16.0 N 29.3 W	30 kt
12 hr	10/1800Z	16.0 N 31.1 W	35 kt
24 hr	11/0600Z	16.3 N 34.2 W	40 kt
36 hr	11/1800Z	16.5 N 37.5 W	45 kt
48 hr	12/0600Z	16.8 N 40.2 W	55 kt
72 hr	13/0600Z	17.0 N 45.0 W	65 kt
96 hr	14/0600Z	18.0 N 49.5 W	80 kt
120 hr	15/0600Z	19.5 N 53.5 W	90 kt

PGI-43:

PGI-43L remains over the African continent located as of 1200 UTC at 11°N, 8°W. Shear is an issue for the system as easterly shear is isolating convective activity to the west of the analyzed pouch location (**43A**). A circulation is evident in both the visible as well as low-level winds (**43B**). The pouch itself is relatively well defined within an area of high moisture (**43C**). The GFS forecasts the system to see its vorticity, OW, and TPW to increase steadily through 12Z tomorrow with shear possibly being a negative in the longer term with values after 72 hours being less than ideal (**43D**). The GFS track forecast brings PGI-43L much more north of the ECMWF which keeps the system moving due west for the most part (**43E**).

Dust/SAL Discussion:

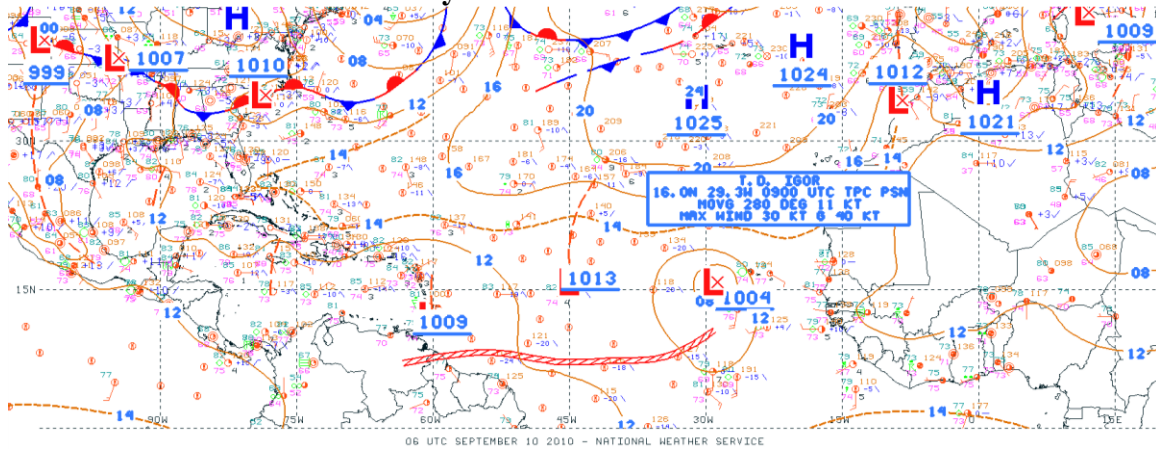
A large amount of Saharan Dust has moved off Africa along with, and behind, Igor. The 0600UTC GEOS-5 analysis, TERRA and AQUA AOT, and True Color analysis all indicate the presence of dust interacting with Igor (**D1, D2, and D3**). However, there are no substantial aerosol concentrations west of about 35W. Water vapor and TPW imagery indicate the presence of dry air stretching from the outflow of Igor all the way to Hispaniola, north of 15N (**S4 and S6**). The GEOS-5 forecast indicates that more dust will emerge from the African coast over the next 24 hours. There is also indication that Igor will continue to interact with dust for at least the next 4-5 days. PGI-43L will also interact with a large amount of dust once it emerges over the Atlantic. However, it is worth noting that the GEOS-5 does not indicate that dust will be wrapped all the way around either Igor or PGI-43L (**D4**). Given the recent performance of the GEOS-5, there is a relatively high degree of confidence in its forecast for the next 5 days.

Seeing as its past forecasts have proven accurate, there is a high degree of confidence in this possibility.

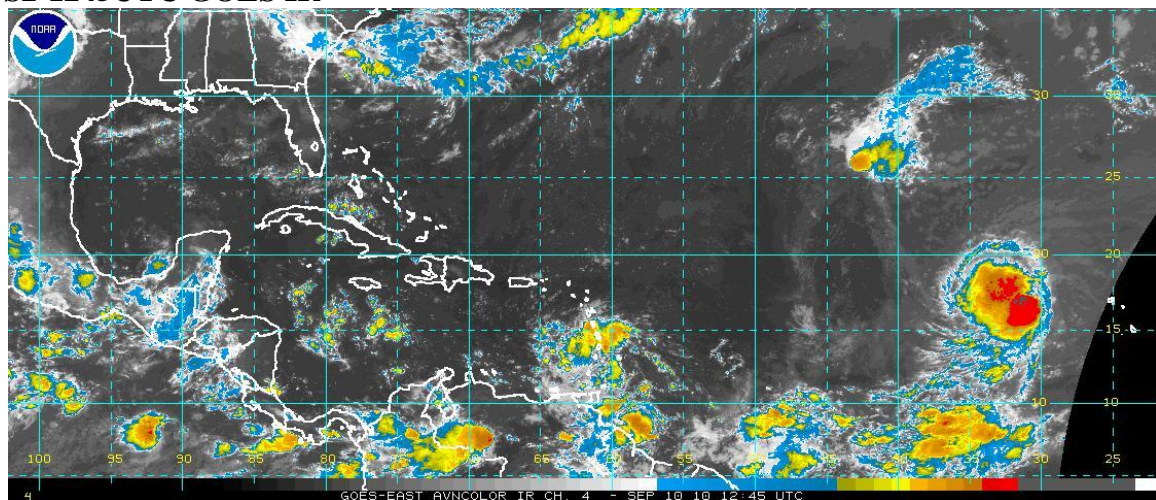
Forecasters: Zelinsky, Maliawco, Harnos, Nguyen, Thomas

Images used in discussion:

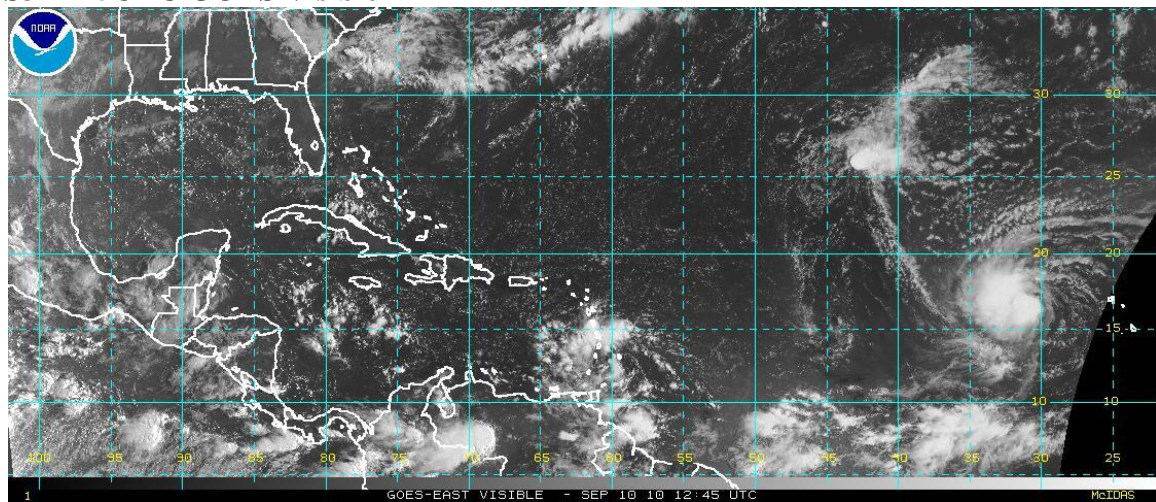
S1-0600UTC OPC Surface Analysis



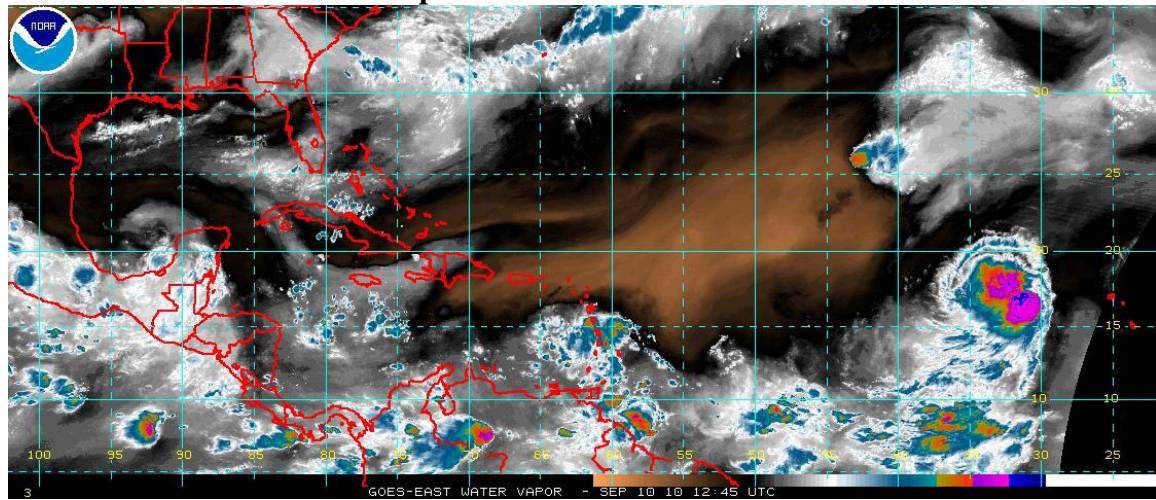
S2-1245UTC GOES IR



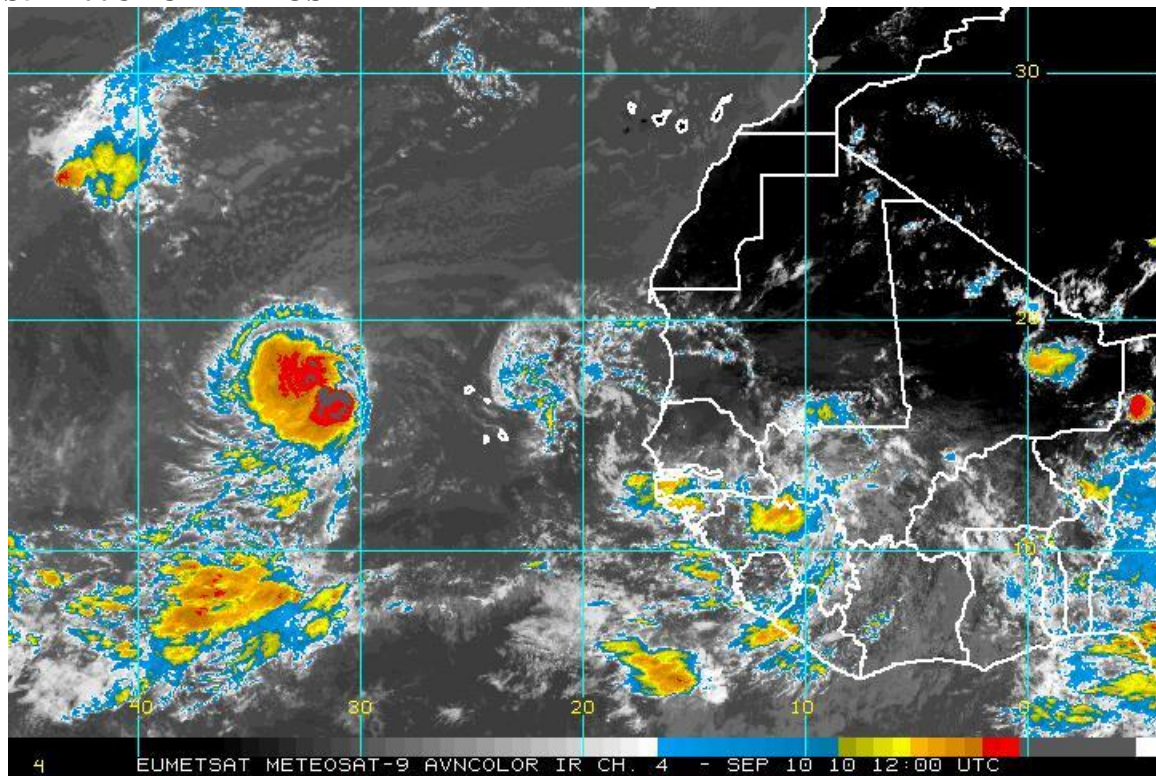
S3-1245UTC GOES Visible



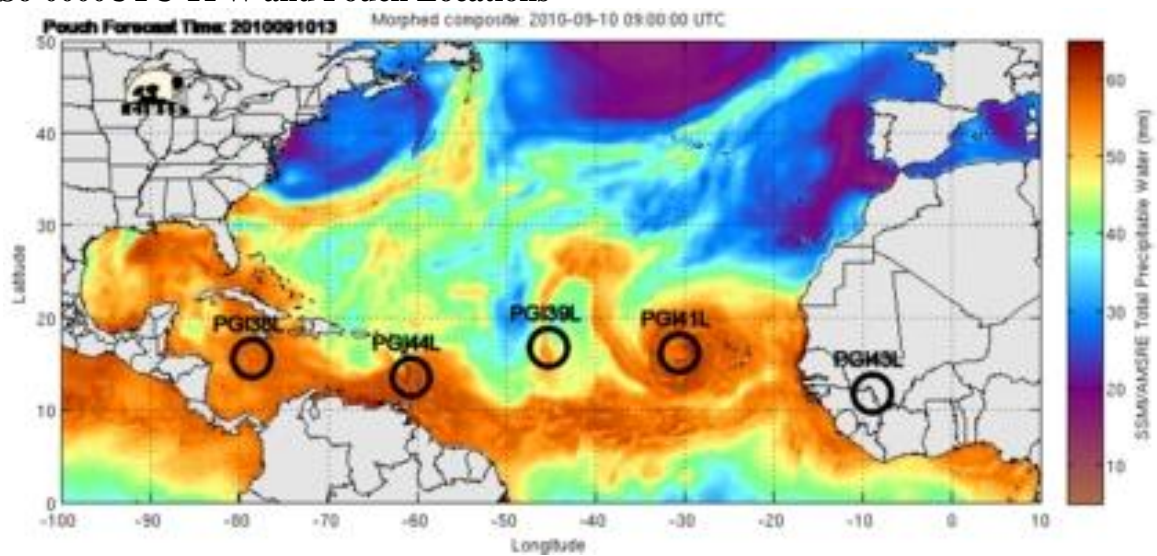
S4-1245UTC GOES Water Vapor



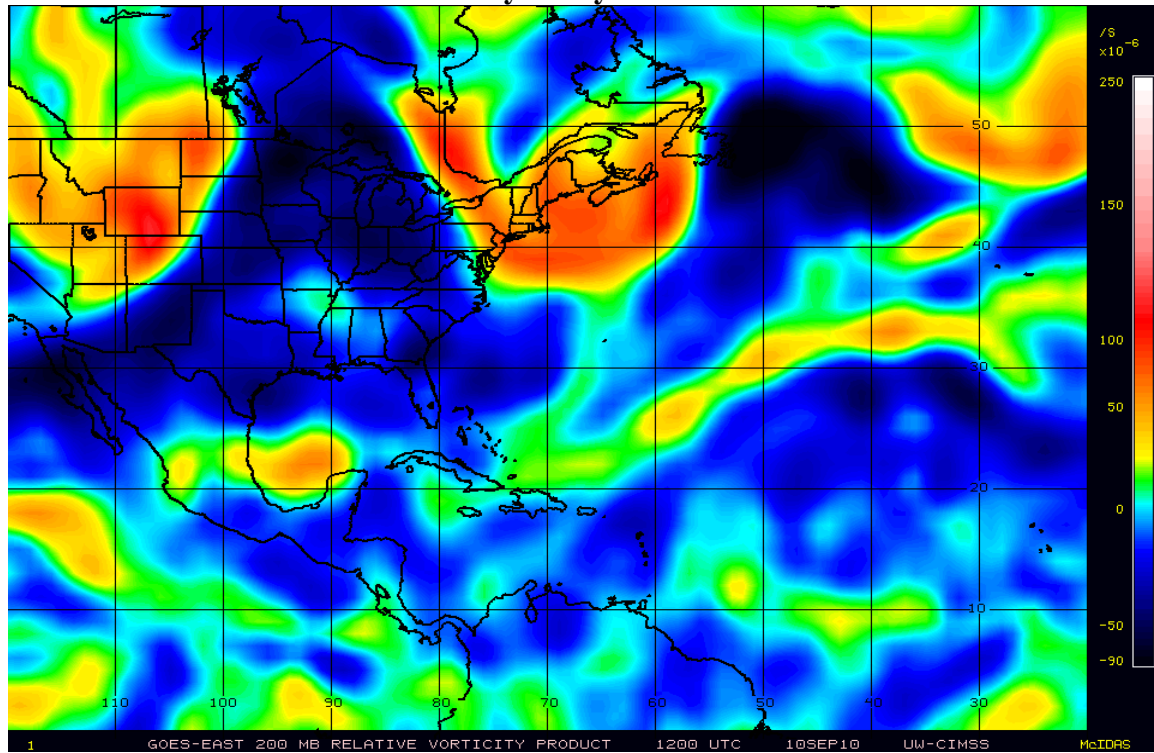
S5-1200UTC METEOSAT IR



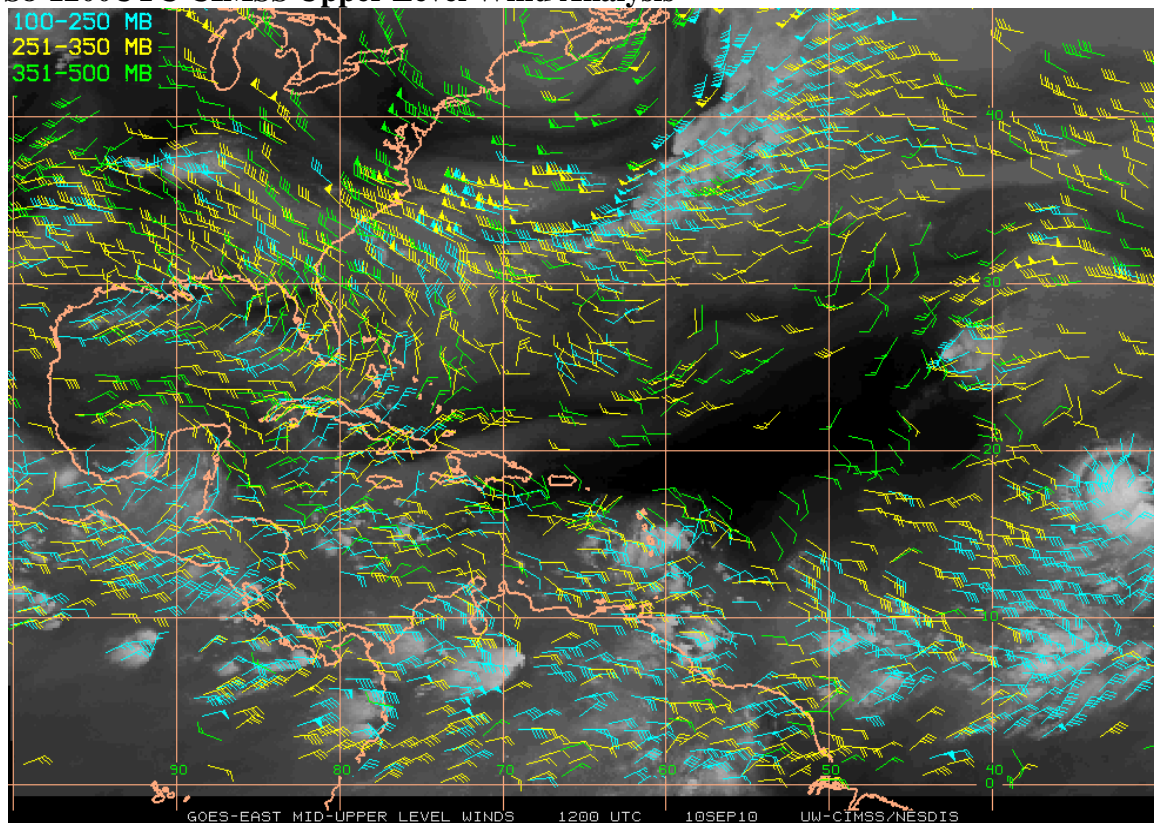
S6-0000UTC TPW and Pouch Locations



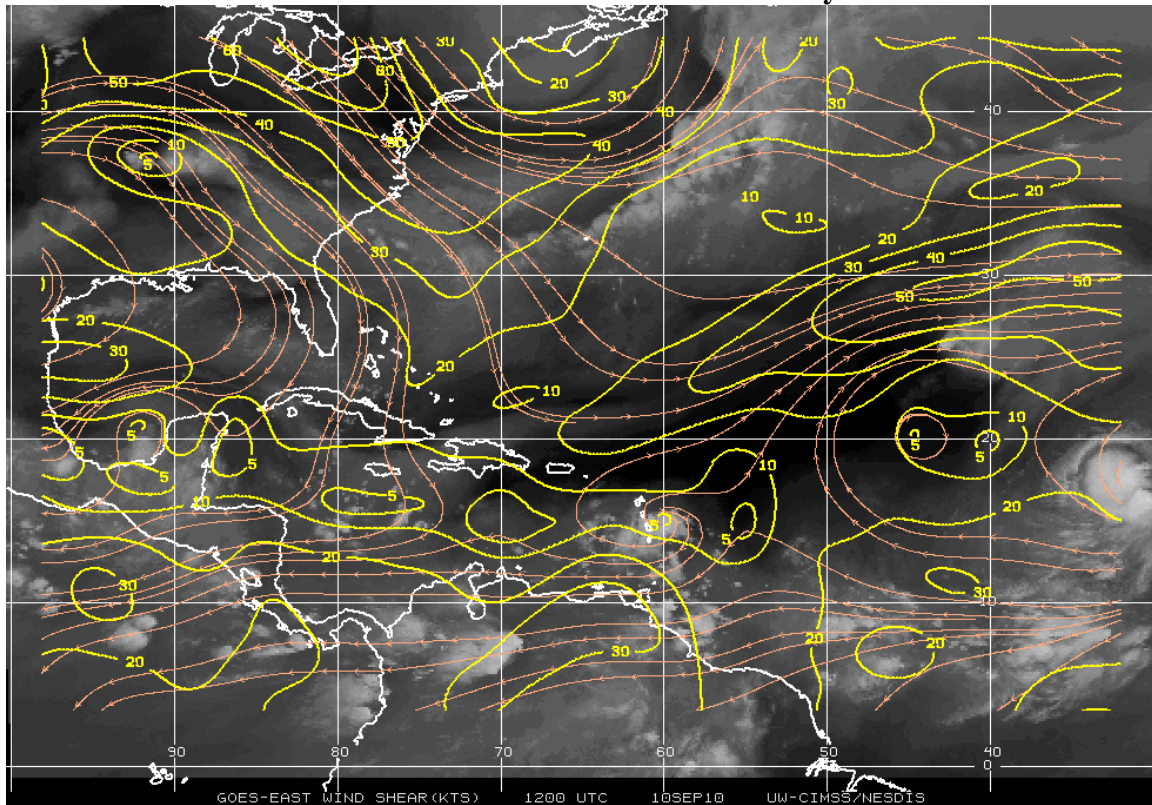
S7-0900UTC CIMSS 200mb Vorticity Analysis



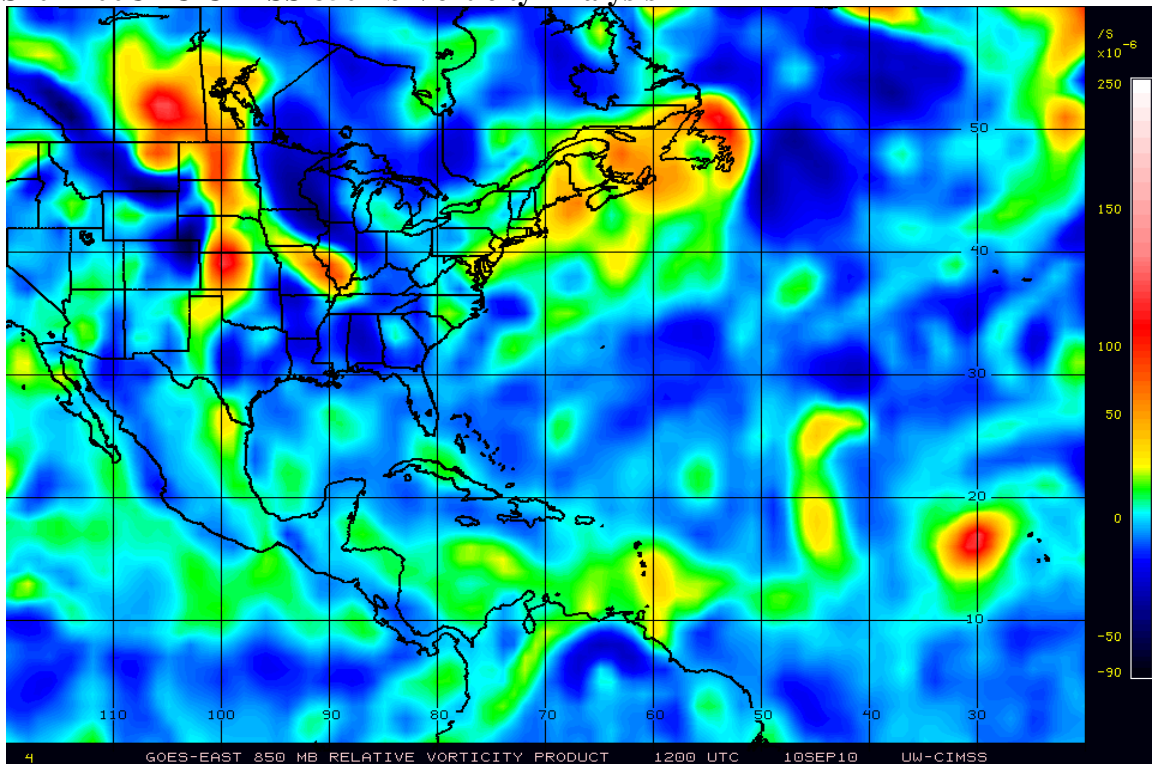
S8-1200UTC CIMSS Upper Level Wind Analysis



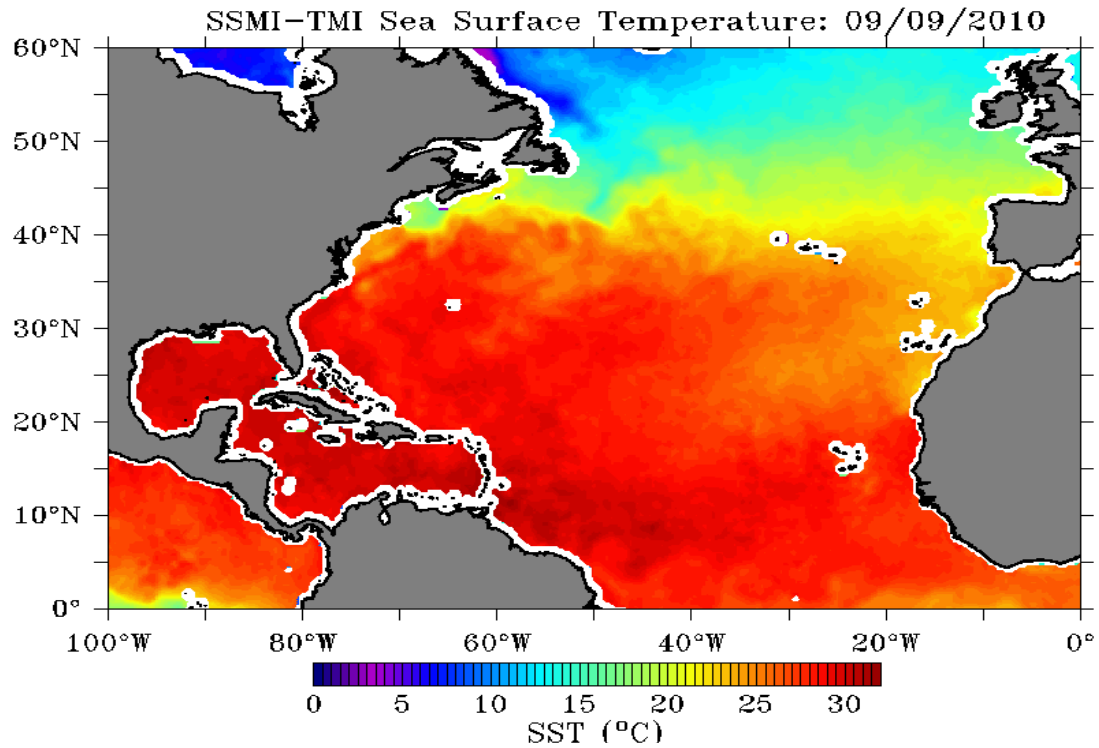
S9-1200UTC CIMMS 850-200mb Vertical Wind Shear Analysis



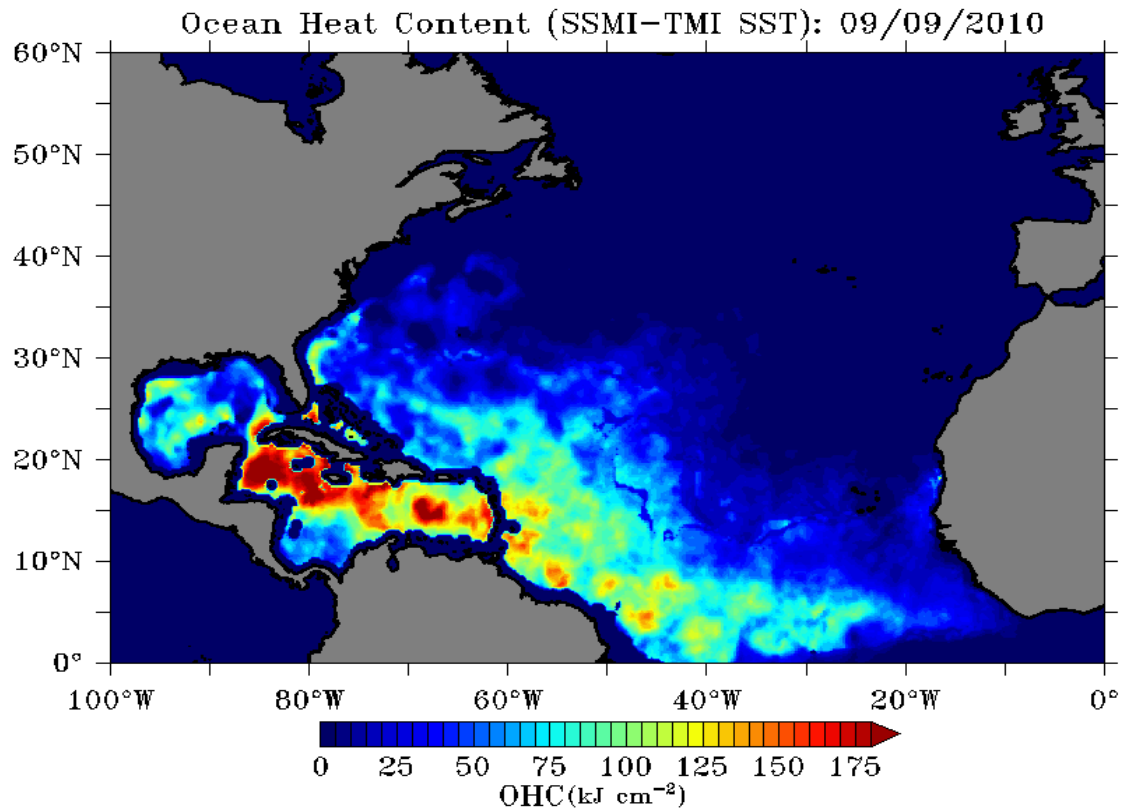
S10-1200UTC CIMSS 850mb Vorticity Analysis



S11

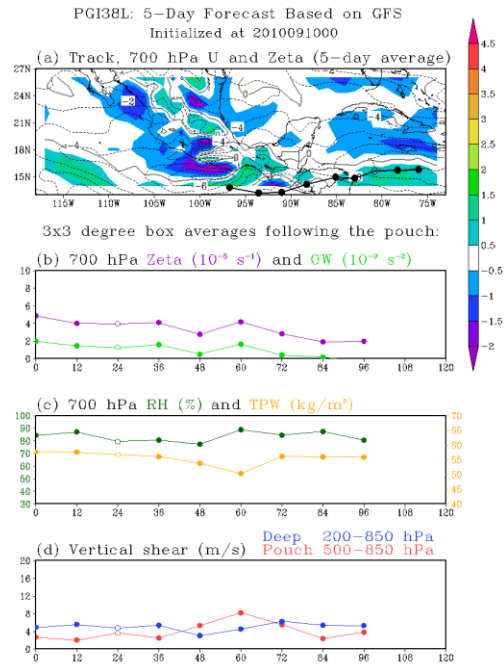
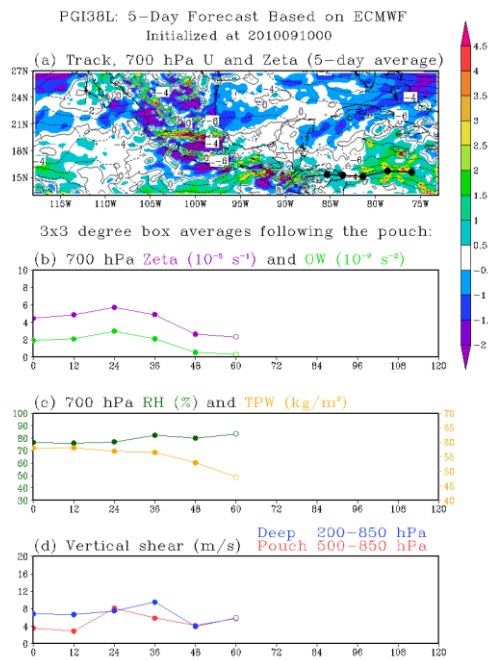


S12



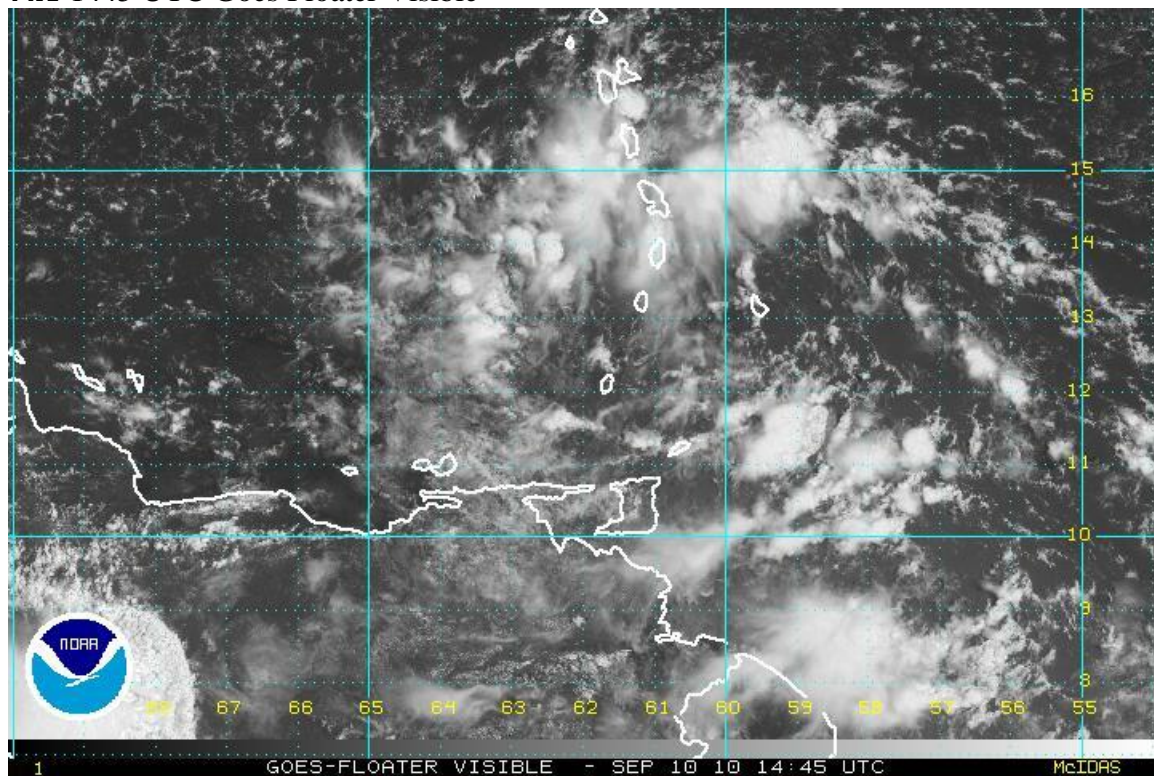
PGI-38L/Ex-Gaston:

G1-09/10 GFS and ECMWF forecasts



PGI-44L/AL92:

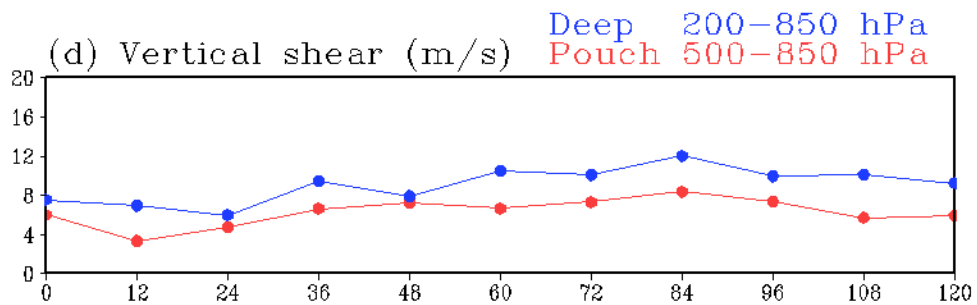
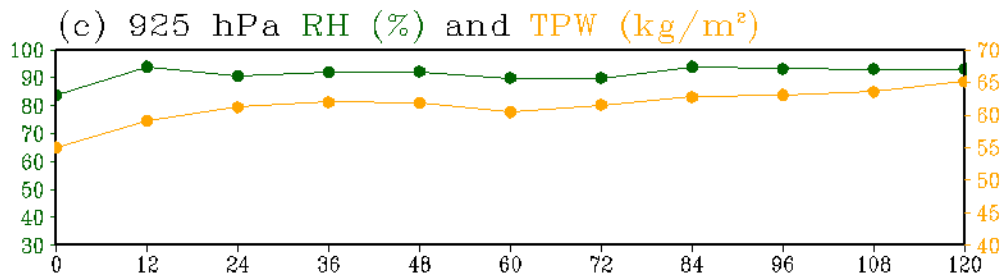
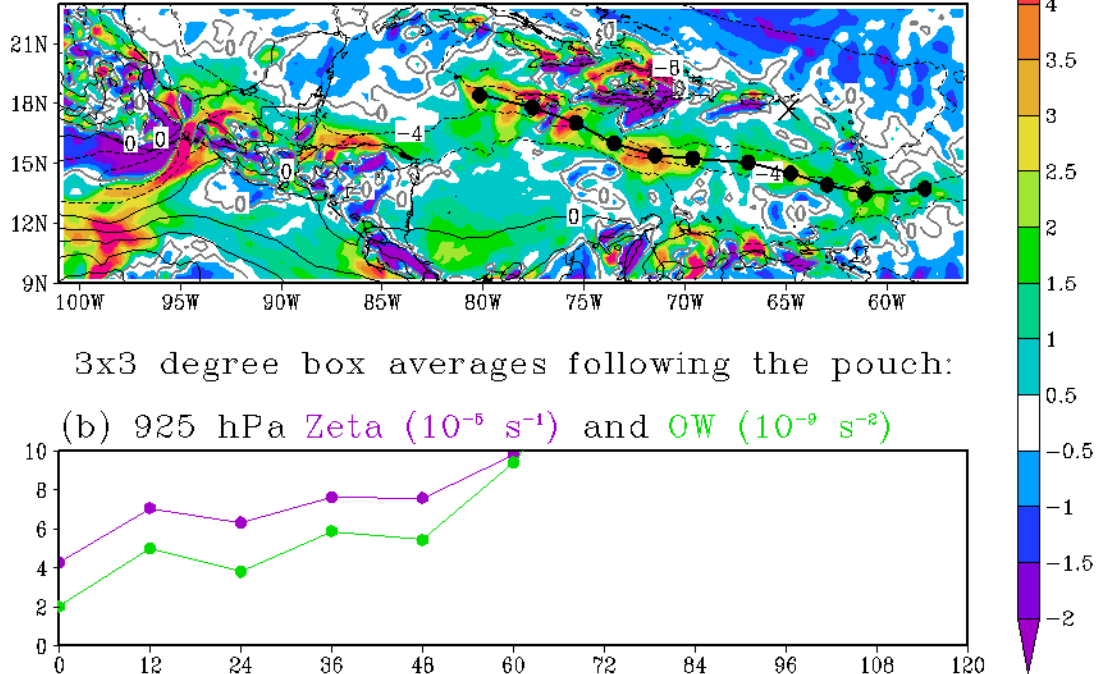
44A-1445 UTC Goes Floater Visible



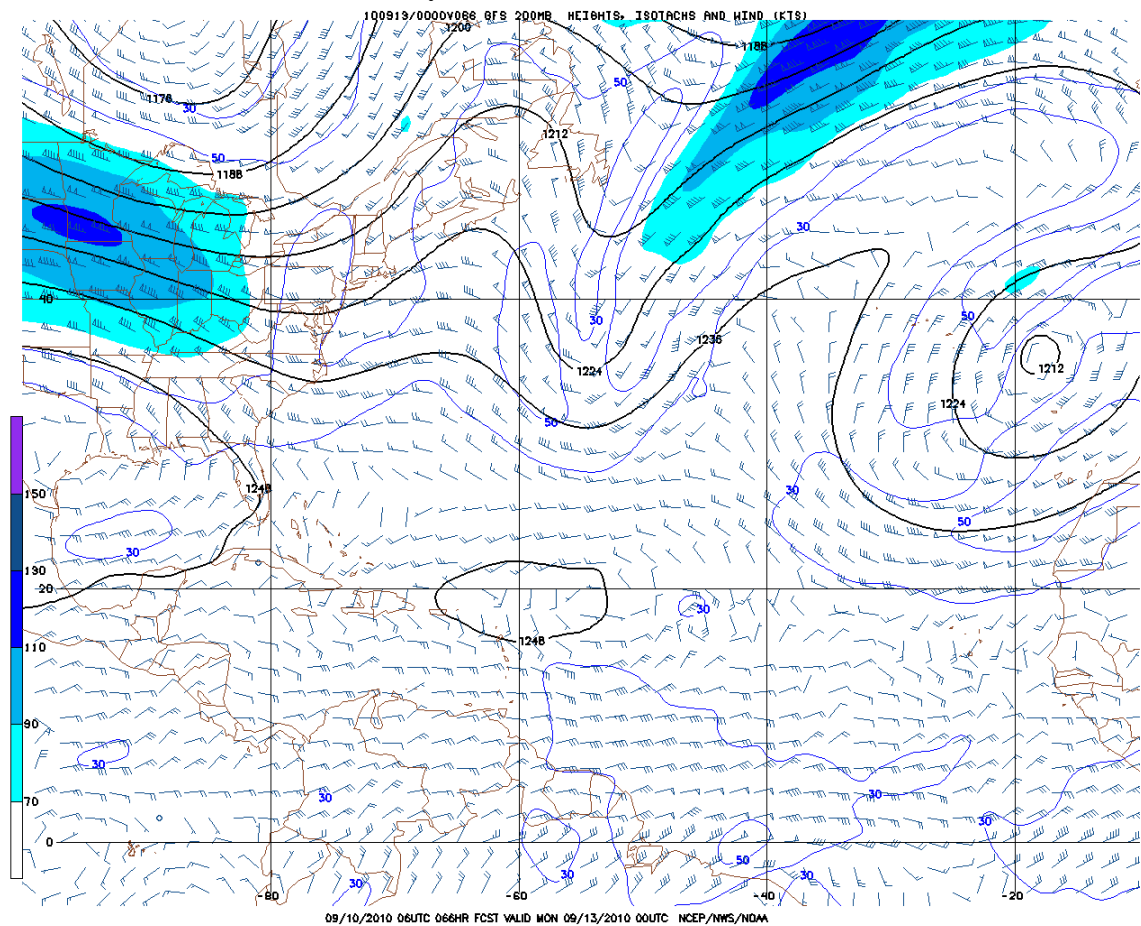
44B

PGI44L: 5-Day Forecast Based on ECMWF
 Initialized at 2010091000

(a) Track, 925 hPa U and Zeta (5-day average)

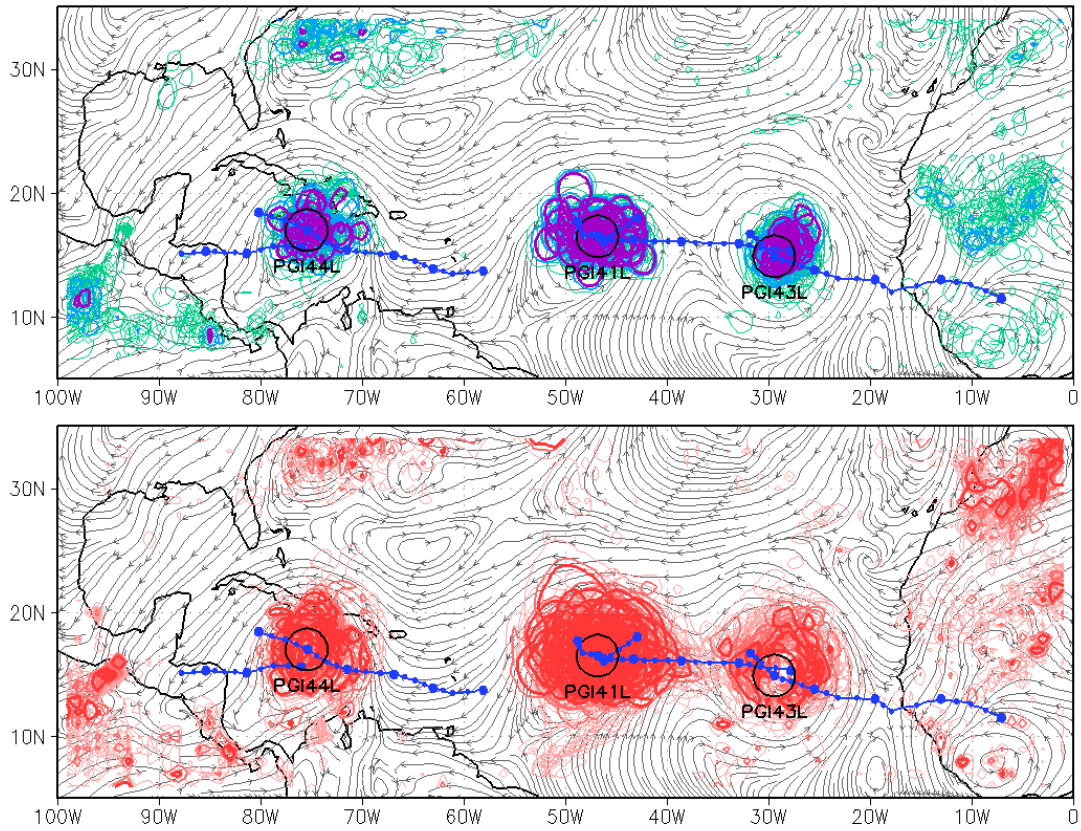


44C- 0000UTC GFS 200mb analyzed Isotachs



44D- 96-hr ECMWF ensemble forecasts

Gray: ECMWF 96-hour CTRL streamlines at 850 hPa. Init. 2010091000, Valid 2010091400.
Color: Spaghetti contours of ZETA x $5e-5 \text{ s}^{-1}$ and OW x $2e-9 \text{ s}^{-2}$. 50 members.

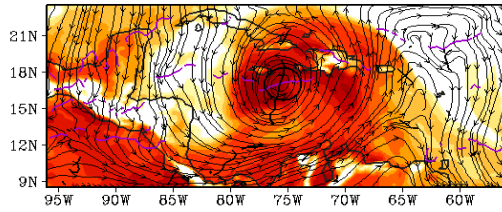
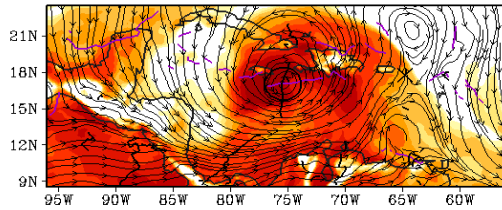
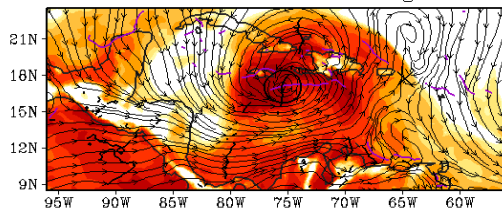
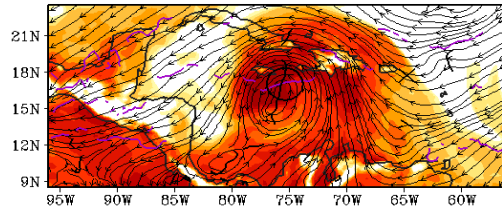
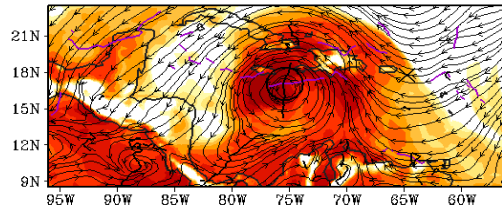
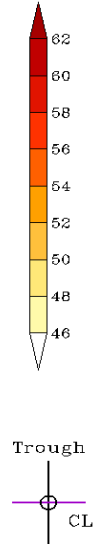
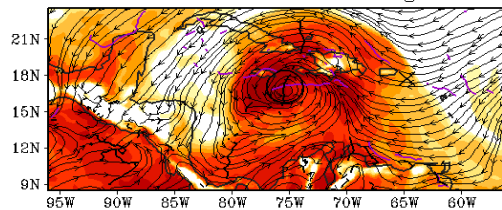


44E

PGI44L: 2010091000 (96h ECMWF valid at 00Z14SEP2010)

Level Tracked: 925 hPa

Comoving ($C_p = -5.3$ m/s)

700 hPa Streamlines and TPW kg m^{-2} 850 hPa Streamlines and TPW kg m^{-2} 925 hPa Streamlines and TPW kg m^{-2} Earth-relative ($C_p=0$ m/s)700 hPa Streamlines and TPW kg m^{-2} 850 hPa Streamlines and TPW kg m^{-2} 925 hPa Streamlines and TPW kg m^{-8} 

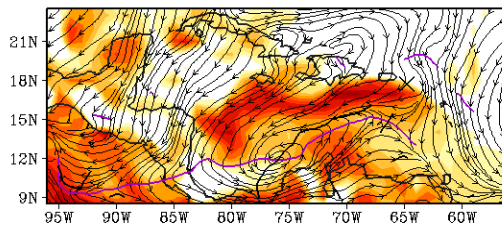
44F

PGI44L: 2010091000 (96h GFS valid at 00Z14SEP2010)

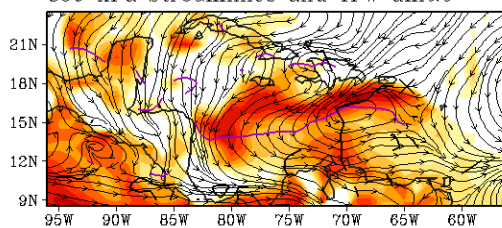
Level Tracked: 925 hPa

Comoving ($C_p = -4.1 \text{ m/s}$)

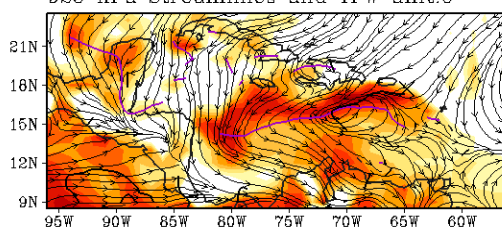
700 hPa Streamlines and TPW unit.6



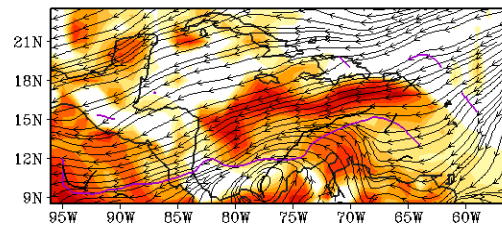
850 hPa Streamlines and TPW unit.6



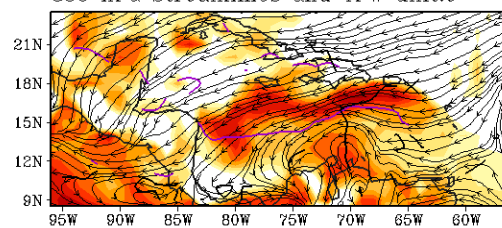
925 hPa Streamlines and TPW unit.6

Earth-relative ($C_p=0$ m/s)

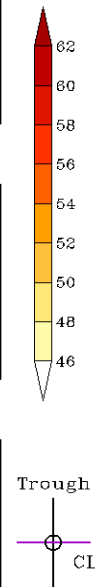
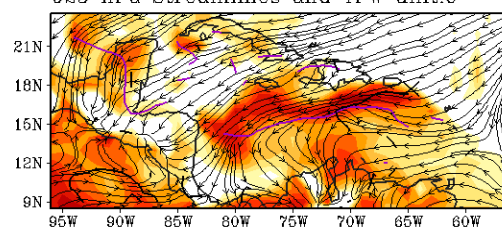
700 hPa Streamlines and TPW unit.6



850 hPa Streamlines and TPW unit.6



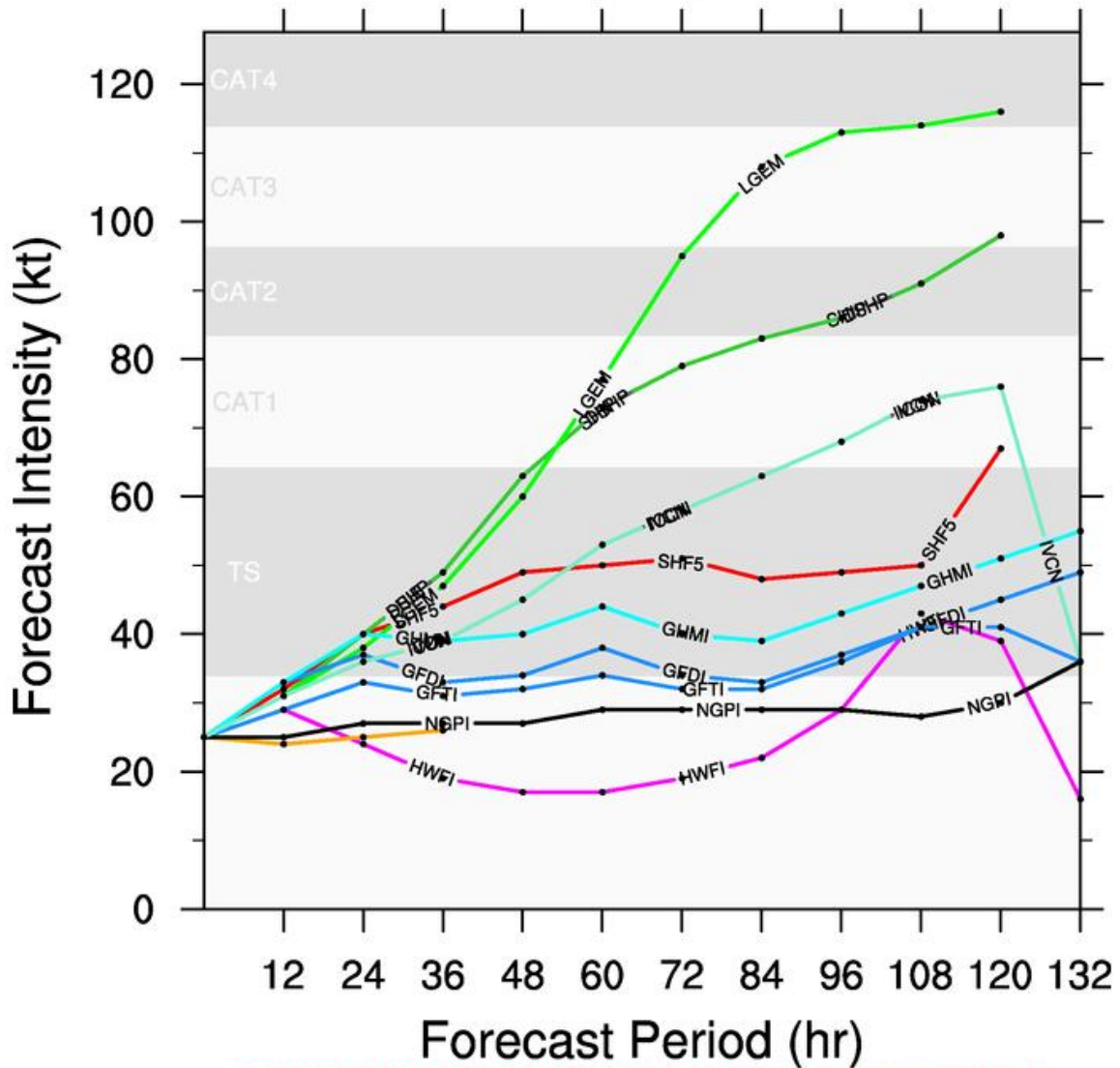
925 hPa Streamlines and TPW unit.6



DISTURBANCE INVEST (AL92)

Early-cycle intensity guidance

valid 1200 UTC, 10 September 2010

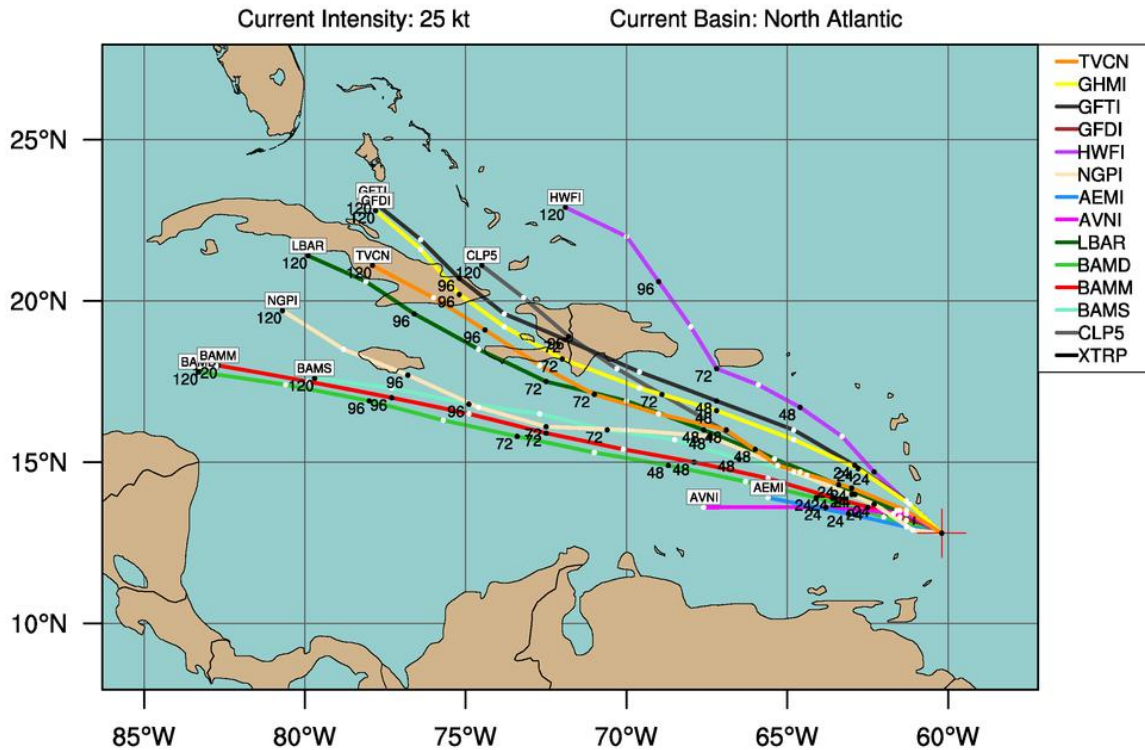


This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

44H

DISTURBANCE INVEST (AL92)

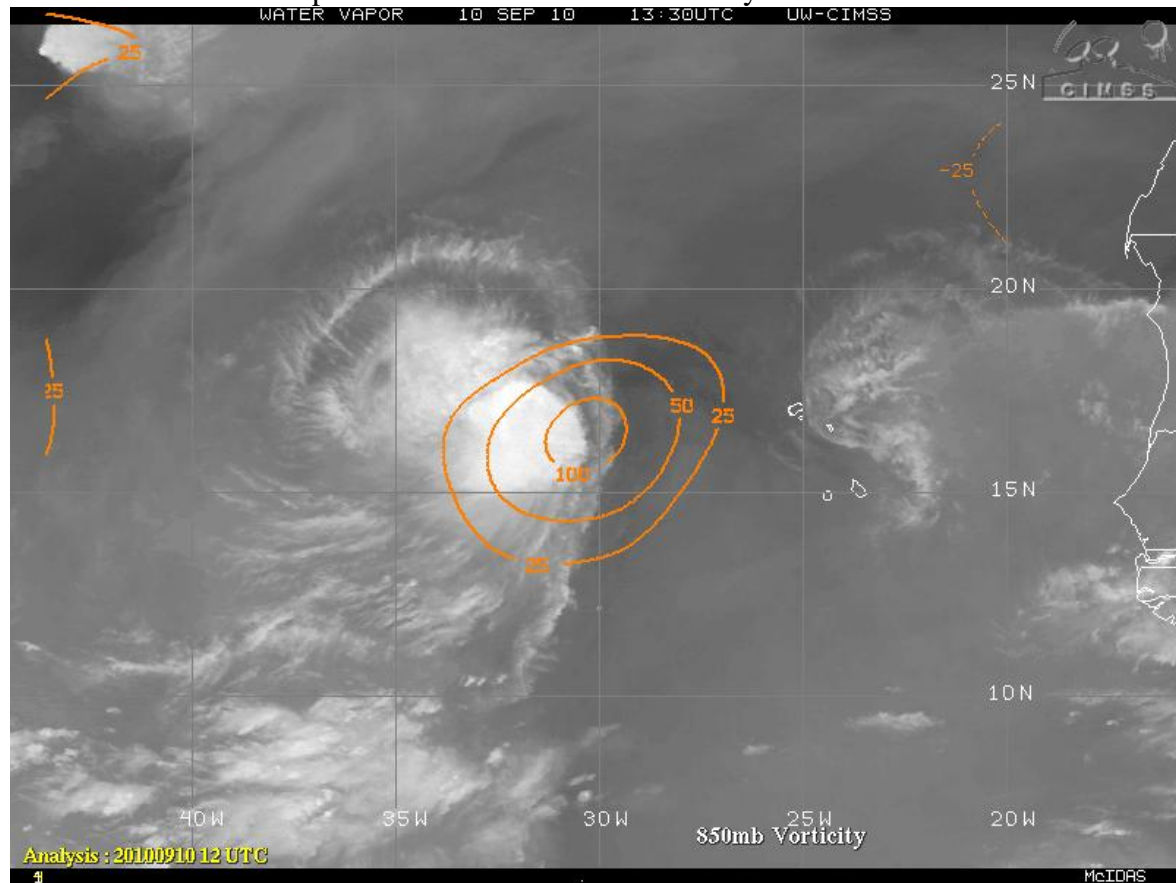
Early-cycle track guidance valid 1200 UTC, 10 September 2010



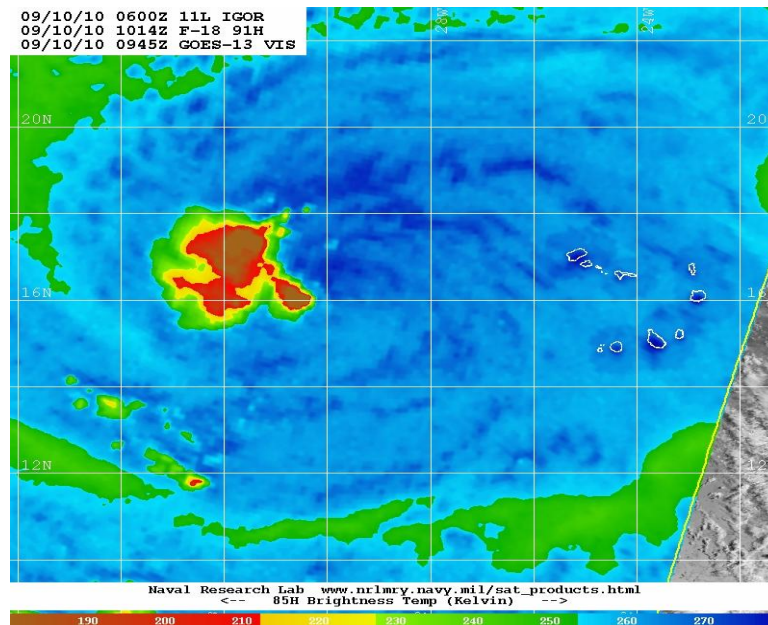
This plot does not display official storm information. Use for information purposes only.
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PGI-42L/Igor

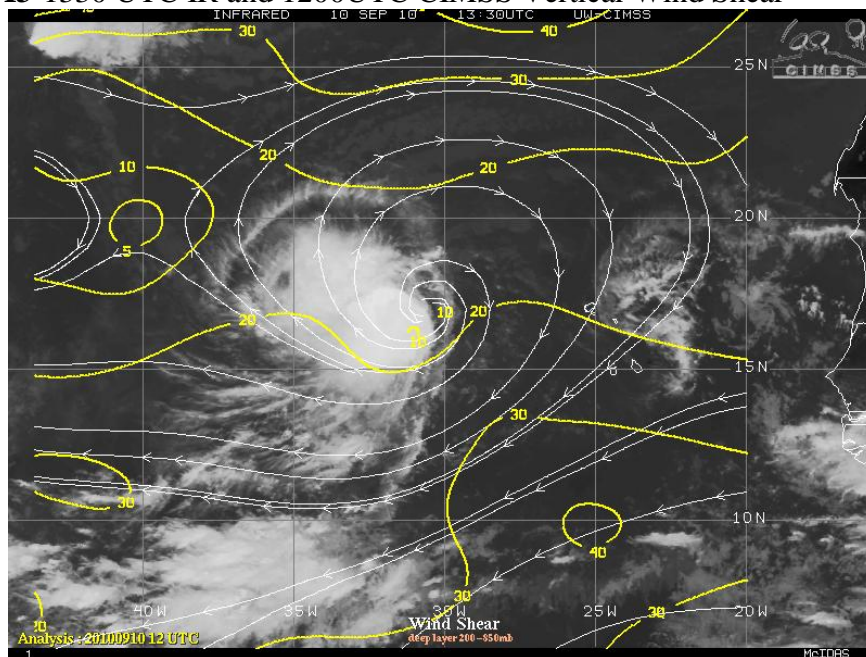
I1-1330 UTC Water Vapor and 1200UTC 850mb vorticity



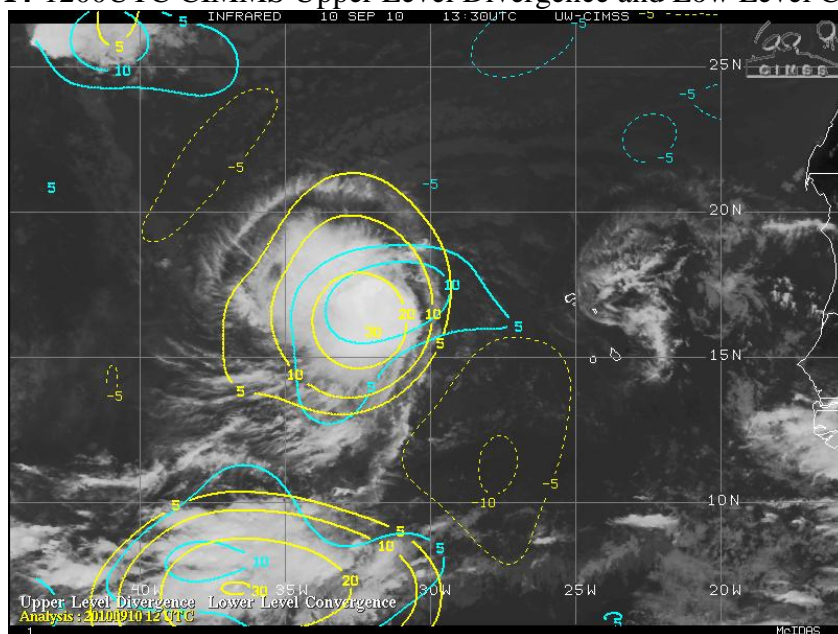
I2-1014UTC NRL Microwave



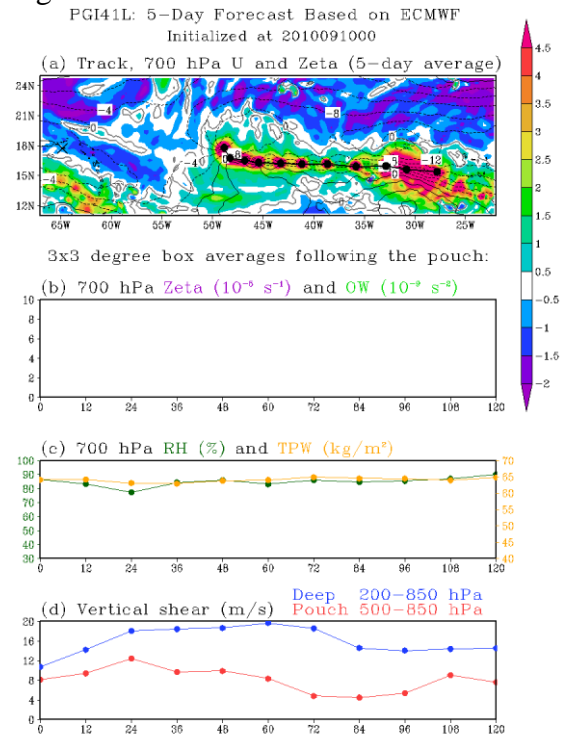
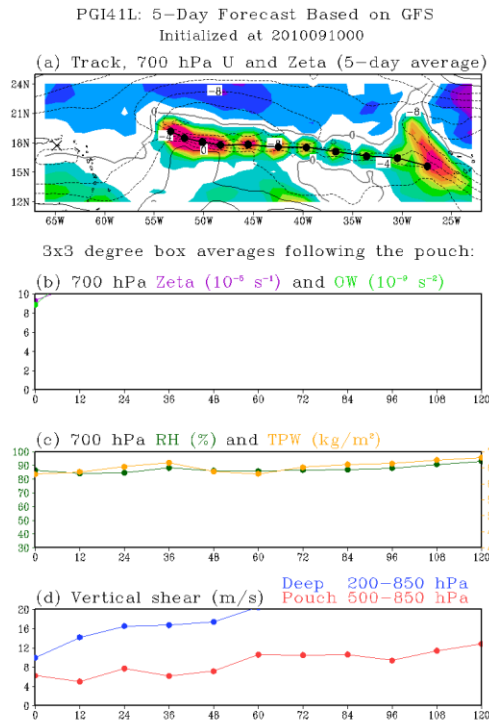
I3-1330 UTC IR and 1200UTC CIMSS Vertical Wind Shear



I4-1200UTC CIMMS Upper Level Divergence and Low Level Convergence



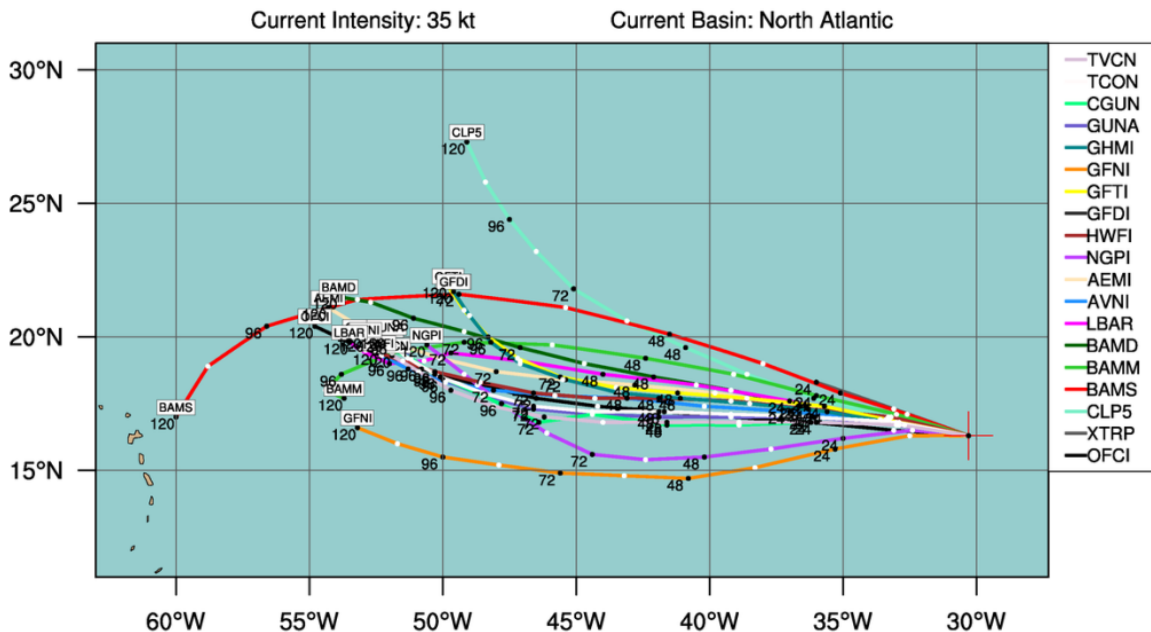
I5- 09/10 Igor GFS and ECMWF Pouch Tracking

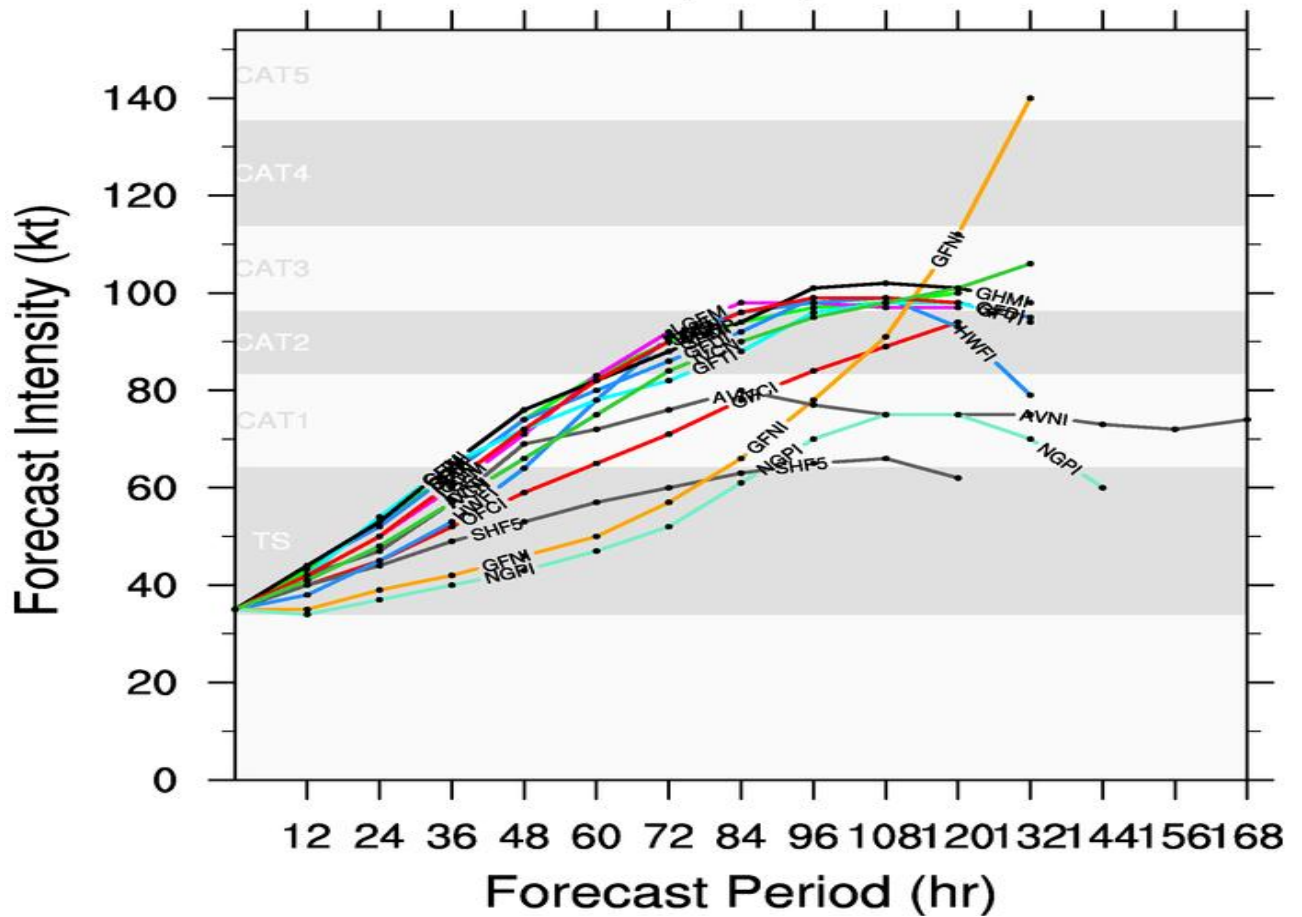


I6

TROPICAL STORM IGOR (AL11)

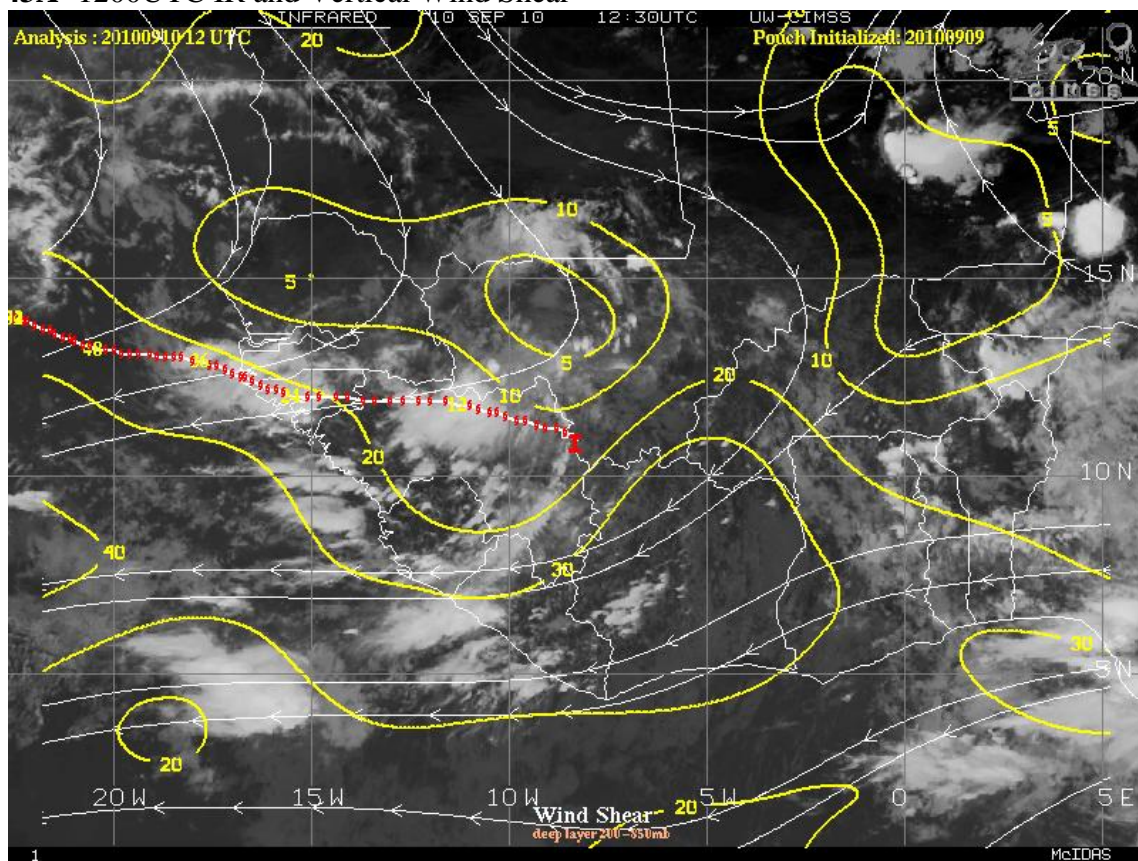
Early-cycle track guidance valid 1200 UTC, 10 September 2010



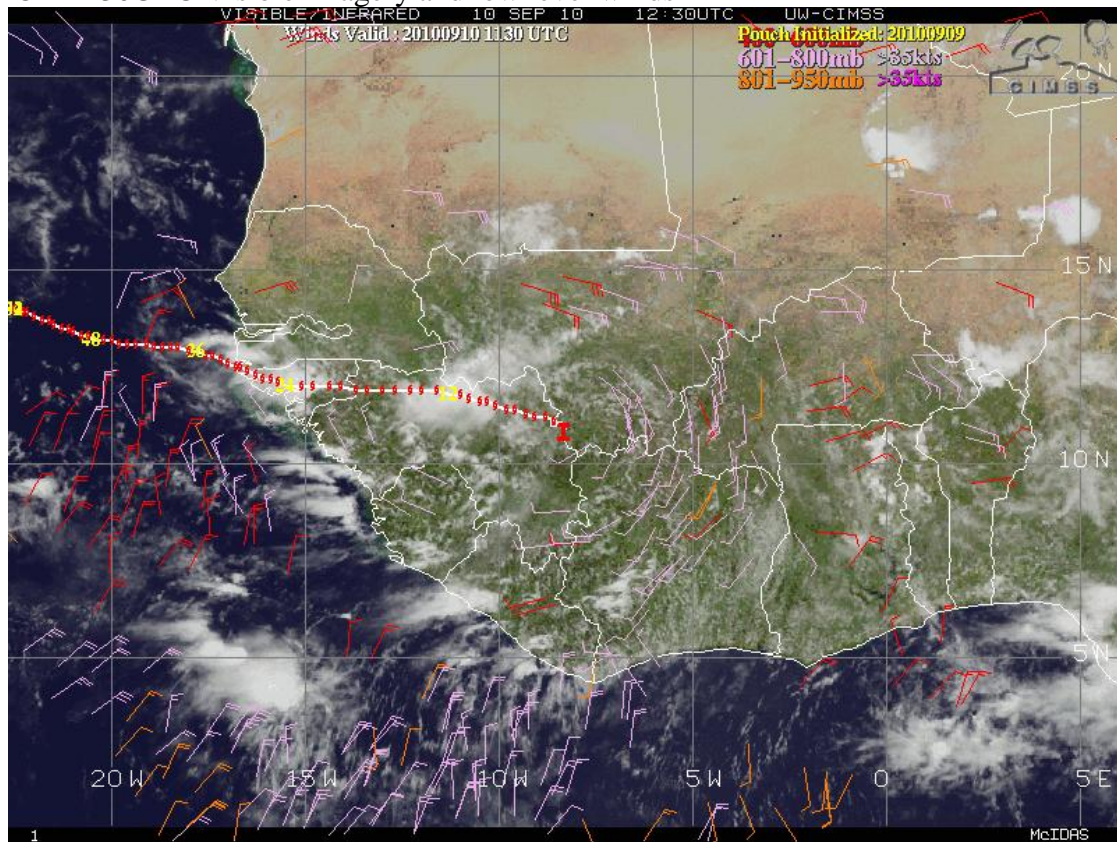


PGI-43L

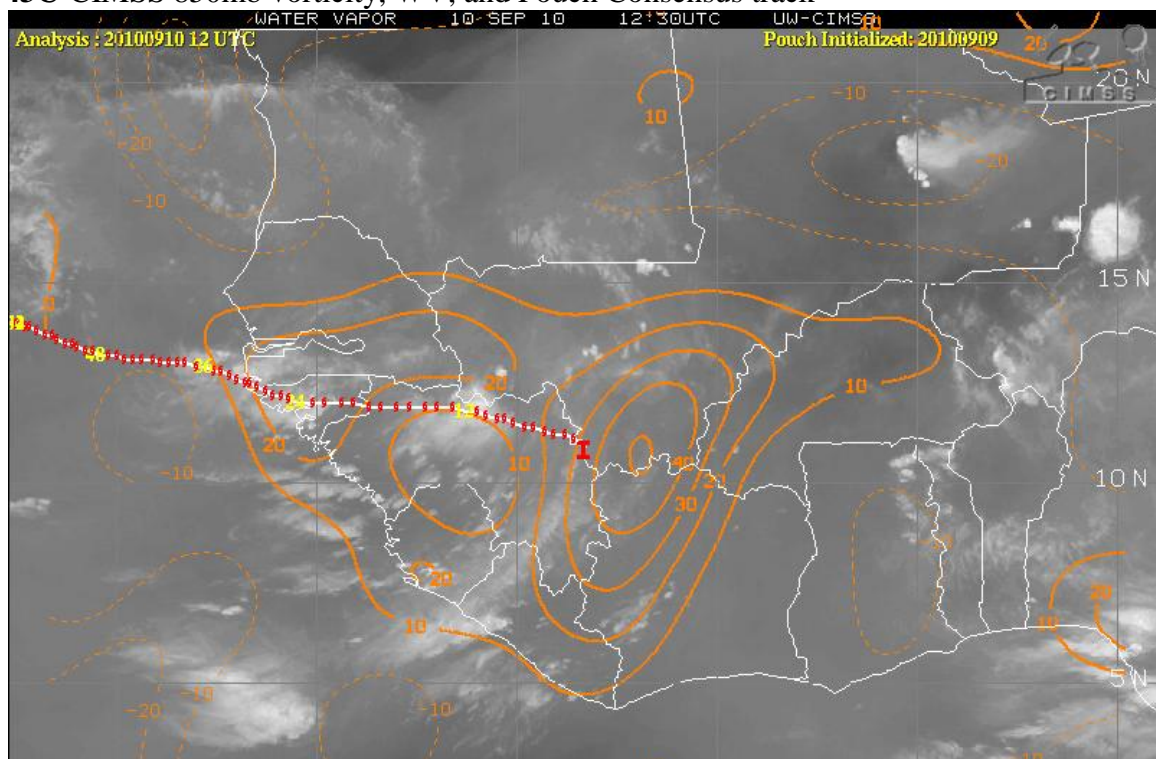
43A- 1200UTC IR and Vertical Wind Shear



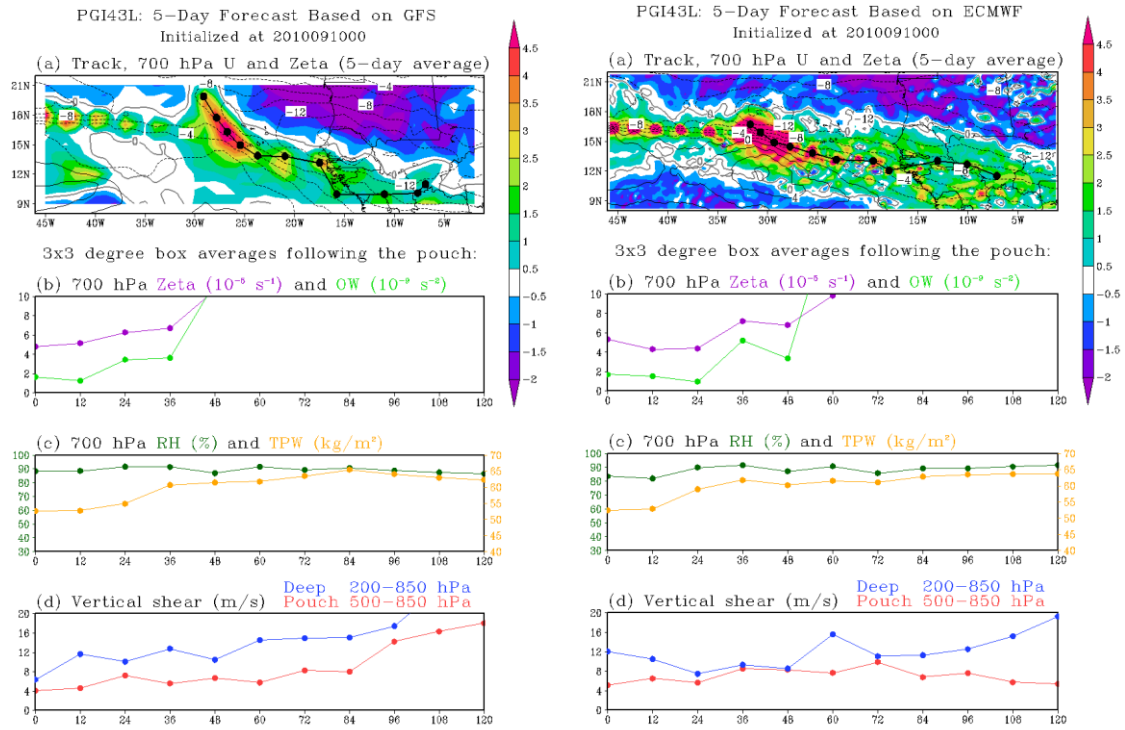
43B-1230UTC Visible Imagery and low level winds



43C-CIMSS 850mb vorticity, WV, and Pouch Consensus track



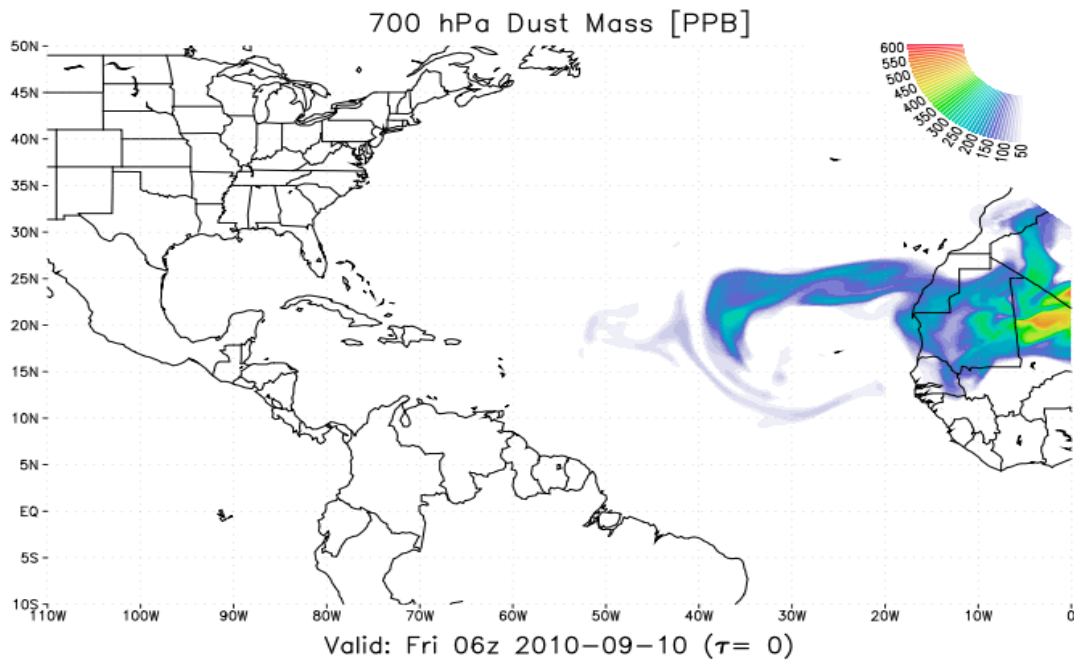
44D- 09/10 GFS and ECMWF Pouch Tracking



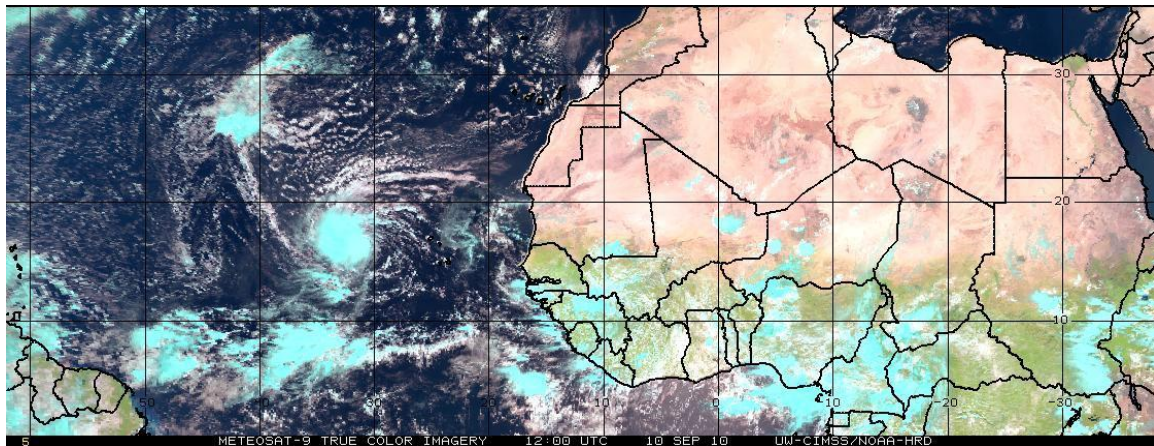
SAL:

D1-GEOS- 0600UTC 700hPa Dust Mass Analysis

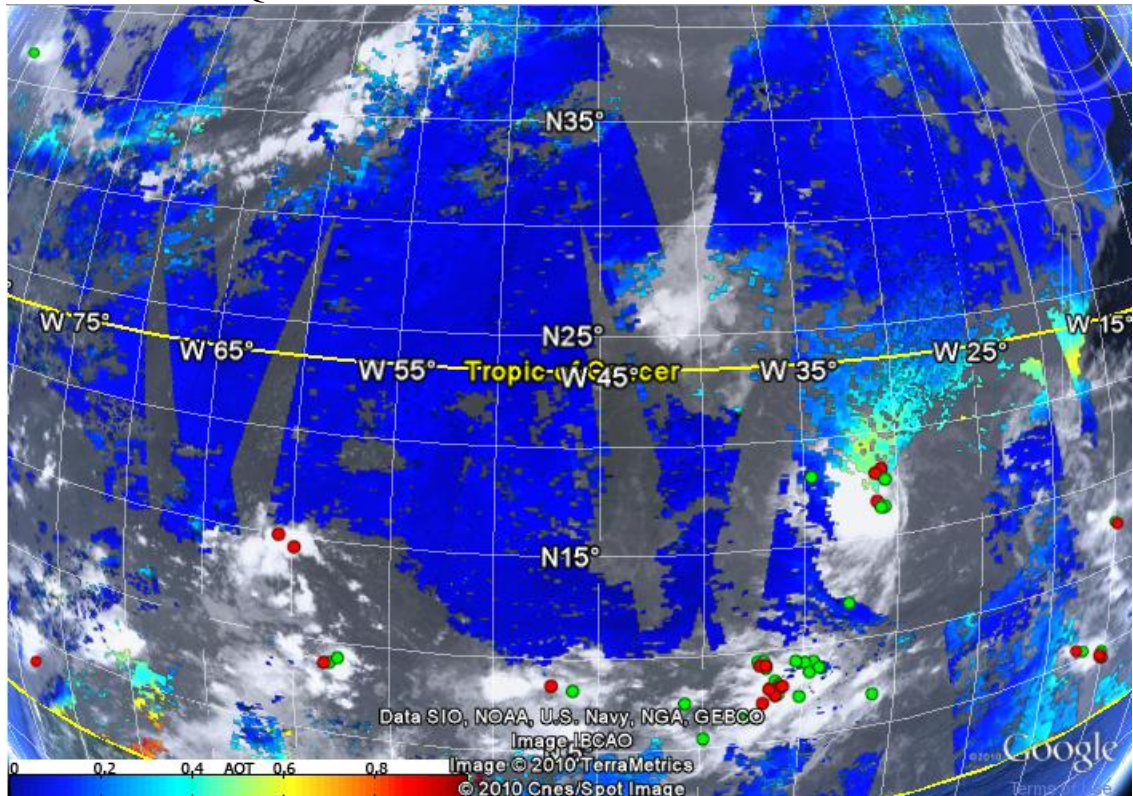
NASA/GSFC Global Modeling and Assimilation Office - GEOS-5 Forecast Initialized on 06z 2010-09-10



D2-1200UTC CIMSS True Color



D3-TERRA and AQUA AOT



D4- 0600UTC GEOS-5 700hPa Dust Mass 72 hour forecast

NASA/GSFC Global Modeling and Assimilation Office – GEOS-5 Forecast Initialized on 06z 2010-09-10

